DOCUMENT RESUME

ED 185 662 EA 012 592

AUTHOR Barrows, Linda K.
TITLE Findings and Implications of the Thirteen School Study.
PUB DATE Apr 80
NOTE 49p.; Paper presented at the Annual Meeting of the American Educational Research Association (Boston, MA, April 7-11, 1980). Charts may not reproduce clearly.

EDRS PRICE MF01/PC02 Plus Postage.
DESCRIPTORS Case Studies; *Change Strategies; *Educational Change; *Educational Innovation; Elementary Education; *Models; *Program Implementation
IDENTIFIERS Change Models (Havelock); Concerns Based Adoption Model; Individually Guided Education; Linkage Model (Havelock)

ABSTRACT

The research discussed in this paper was intended to identify factors that promote or retard change in schools and to relate those factors to the modifications they foster. Data were collected from 13 Wisconsin elementary schools to determine what factors affect (1) the decision to adopt an innovation, (2) the rate of implementation of an innovation, (3) the adaptation of an innovation, and (4) the decision to abandon or replace the innovation. The findings were compared to six current models of change. The models, discussed in detail, were the problem-solving model; the social interaction model; the research, development, and diffusion model; the linkage model; the concerns-based adoption model; and the Individually Guided Education model. Results showed that none of the six models proved adequate in explaining the adoption histories of the 13 sites. The paper then discusses assumptions and utility of each of the change models and suggests an alternative conceptualization of the adoption process. The paper concludes that future research should attempt to relate differing patterns of adoption to the degree of implementation of an innovation. (Author/LD)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
NATIONAL INSTITUTE OF EDUCATION

THIS DOCUMENT HAS BEEN REPRODUCED EXACTLY AS RECEIVED FROM THE PERSON OR ORGANIZATION ORIGINATING IT. POINTS OF VIEW OR OPINIONS STATED DO NOT NECESSARILY REPRESENT OFFICIAL NATIONAL INSTITUTE OF EDUCATION POSITION OR POLICY

FINDINGS AND IMPLICATIONS OF THE THIRTEEN SCHOOL STUDY

Prepared by

Linda K. Barrows

Wisconsin Research and Development Center
for Individualized Schooling
University of Wisconsin-Madison

Presented at the Annual Meeting of the
American Educational Research Association
Boston, Massachusetts

April 1980

EA 012 592

"PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

L. Barrows

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

Overview of the Research

The Studies of Implementation was proposed as a 3-year longitudinal investigation of planned educational change. Specifically, the focus of the research was the process by which an innovation was implemented into and became a pattern of individualized schooling. The research was intended to identify those factors or conditions which promoted or retarded change in schools and relate the factors to the modifications they fostered.

The Studies of Implementation work group documented and analyzed the innovative behavior of 13 elementary schools which had chosen a course of planned educational change. The instructional innovation which all 13 schools had chosen to implement was the Instructional Programming Model (IPM), the central concept of the organizational innovation Individually Guided Education (IGE).

The population of the research sites was originally limited to Wisconsin IGE elementary schools. The population of such Wisconsin schools was stratified by the number of years a school claimed to be an IGE school, whether the school was located in a non-urban or an urban (Milwaukee) area, and by use of the curricular products developed at the Wisconsin Research and Development Center. With one exception, potential research sites were randomly selected from these strata. The exception involved the deliberate selection of a non-urban school which had just made the decision to implement the IPM. Ten Wisconsin research sites were selected.

A troublesome feature of the sampling plan was the questionable representativeness of the urban schools which, by necessity, all had to be located in Milwaukee. A decision was made to obtain three additional urban sites outside of Wisconsin in order to provide a point of comparison. All three sites had chosen to adopt and implement Developing Mathematical Processes (DMP), a curricular product based on the Instructional Programming Model. Thus, the sample was expanded to include 13 schools. Table 1 summarizes the salient characteristics of the research sites.

Using a combination of quantitative and qualitative techniques, data were collected in the 13 sites to answer four research questions.

1. What factors affect the decision to adopt an innovation (the IPM)?
2. What factors affect the rate of implementation of an innovation (the IPM)?
3. What factors affect the adaptation of an innovation (the IPM)?
4. What factors affect the decision to abandon or replace the innovation (the IPM)?

Year-one data collection focused only on the first question and this paper addresses only these data results.

Purpose of the Paper

The purpose of this paper is to relate the empirical findings of the Studies of Implementation to six current models of change. Six widely disseminated models of change are examined relative to their applicability to the processes by which the innovation (the IPM) was adopted in the 13 research sites.

Table 1

DESCRIPTION OF THE THIRTEEN RESEARCH SITES AT THE TIME OF SELECTION

School Name	Number of Years Using the IPM	Setting	Number of Students	Number of Teachers	Use of R&D* Curricular Products
Lewis	Less than 1	non-urban	437	18	NU
Star	1	urban	525	20	WDRSD
Arrow	2	non-urban	315	13	WDRSD
Mercury	4	urban	468	18	DMP
Meadow	6	non-urban	97	5	WDRSD
Sawyer	7	non-urban	350	13	WDRSD
Rise	7	non-urban	395	14.5	DMP;WDRSD
North	7	non-urban	285	12	DMP
Davis	7	non-urban	465	17	NU
York	4	urban	500	15	WDRSD
Canal	2	urban	620	26	DMP
Ware	2	urban	750	40	DMP
Miller	2	urban	507	25	DMP

* NU = Not Used
DMP = Developing Mathematical Processes
WDRSD = Wisconsin Design for Reading Skill Development

Source: Davis, W.; Klenke, W.; and Barrows, L. 1979.

Cursory examination of the literature on planned educational change reveals that there is wide variation in the definitions of several terms. To avoid possible confusion, the definitions used by the Studies of Implementation work group are explicated below.

1. Change: We accept the definition of change suggested by Miles (1964): "[an] alteration in the goals, structure, or processes of a system" (p. 13). This definition allows change to take a variety of forms ranging from a relatively superficial alteration to a major reorientation in the value structure of a system. Further, the definition focuses on the institution not on individuals.

2. Planned Change: Limiting Miles' definition to include only purposive behavior, we define planned change as a deliberate alteration in the goals, structure, or processes of a system.

3. Innovation: Miles' (1964) definition of innovation incorporates the three criteria which we consider to be essential in delineating the term--intention, uniqueness, and specificity. Thus, we have accepted his definition of innovation: "A deliberate, novel, specific change, which is thought to be more efficacious in accomplishing the goals of a system" (p. 14).

4. Adoption Process: We define the adoption process as those activities which precede the actual use of an innovation. These activities may include problem awareness, innovation awareness, consideration of the merits of an innovation, the actual decision to use the innovation,and a trial period. The adoption process ends as the innovation is applied to the client group.

5. Implementation Process: The implementation process begins when the innovation is actually put into effect. By our definition, implementation is synonymous with use.

6. Adaptation: Adaptation includes those activities that either modify the innovation to meet environmental conditions or modify the system to meet the requirements of the innovation. Adaptations may occur either during the adoption and/or the implementation processes and are the result of the interaction between the system and the innovation.

7. The Change Process: The change process includes adoption, implementation, and adaptation and results in an alteration of the goals, structure, or processes of a system. The underlying dimension of this definition is time: "Whether or not an activity is an adoption or implementation event depends on when the activity occurs not necessarily on the nature of the activity. Adaptation may occur at any time in the change process" (Barrows et al., 1979).

The Change Models

The literature on change and knowledge utilization in education is replete with models which seek to explain the process by which individuals, organizations, and systems change. The various models are based on different assumptions about the role of participants in the change process, the origin of the proposed change, and the phases preceeding actual use of an innovation. Six models which represent a diversity in change perspectives were selected. Three widely disseminated models of change identified by Havelock (1969)--the problem-solving model, the social interaction model, and the research, development, and diffusion model--were chosen. Two synthesis models--Havelock's linkage model and the Concerns-Based Adoption Model (CBAM) were also included. The CBAM was chosen because it provides the theoretical basis for the Levels of Use Interview, the instrument originally identified by the Studies of Implementation to assess the

degree of implementation of the IPM innovation. The sixth model, the IGE model, was chosen because it represents the change process from the innovation developers' perspective.

The Problem-Solving Model

The problem-solving model is a user-centered approach to change. The model depicts a sequence of patterned activities which begins with user awareness of a problem and extends to search, selection, and trial of an innovation designed to solve the problem. The problem-solving model has its primary emphasis on the development of a solution to meet a need felt by the user system and is based on the following assumptions:

1. The user system recognizes a need or problem and desires a solution.
2. The user system actively participates in seeking a solution.
3. The resource system assumes a collaborative role.
4. The user system actively participates in the selection of a solution (Barrows et al., 1979).

The Social Interaction Model

The social interaction model describes the change process as the diffusion of innovations through informal personal contact. The

model, which evolved from the agricultural diffusion literature, depicts change as a multi-stage process. Rogers and Shoemaker (1971) listed the four stages as knowledge, persuasion, decision, and confirmation. The social interaction model is essentially a diffusion model and highlights the importance of informal contacts in the spread of new ideas. The underlying assumptions of the model are the following:

1. The innovation to be adopted already exists in a developed form.
2. The adoption process begins by awareness of the innovation or a problem by the user system.
3. Innovation awareness occurs through personal contact with professional peers.
4. The user system actively seeks information about the feasibility of the innovation for the present situation (Barrows et al., 1979).

The Research, Development, and Diffusion (RD&D) Model

This model emphasizes the perspective of the developers of an innovation. Four sequential phases are suggested by this model which depicts the change process as a rational sequence. The phases according to Clark and Guba (1967) are: research, development, diffusion, and adoption. The RD&D model has two major emphases: innovation development and diffusion. The following are underlying assumptions:

1. The innovation is created by an R & D organization employing an orderly developmental sequence.
2. Awareness of the innovation by the user group is the result of dissemination efforts by representatives of the R & D organization.
3. The user system accepts the recommendation of the R & D organization to adopt the innovation. (Barrows et al., 1979).

The Linkage Model

The linkage model is a synthesis model developed by Havelock in an attempt to combine the most meritorious traits of the problem-solving, social interaction, and RD&D models. The unifying concept which Havelock (1969) used to combine the strongest features of the three models was linkage, i.e., the meaningful relationship between the outside resource system and users. The linkage model emphasizes both solution development and diffusion of the solution and rests on the following assumptions:

1. The user system recognizes a need or problem and desires a solution.
2. There must be a reciprocal relationship between the resource and user systems characterized by the ability of each to simulate the search and retrieval process of the other.
3. The development of reciprocal relationships creates a stable and long-lasting social influence network (Barrows et al., 1979).

The Concerns-Based Adoption Model (CBAM)

According to its developers, the CBAM is an eclectic model which combines concepts from all four of the above models (Hall, Wallace, Dossett, 1973). CBAM describes the change process as the interaction between the user system, the resource system, and a temporary third system--the collaborative adoption system. The CBAM specifies eight discrete levels of use of an innovation that range from non-use to renewal. The CBAM assumes that

1. The user system recognizes a need or problem.
2. The innovation to be adopted is already in a developed form.
3. A collaborative adoption system, a temporary third system, links the user and resource system together.
4. The innovation is adopted by the user system to solve an identified problem (Barrows et al., 1979).

The IGE Model

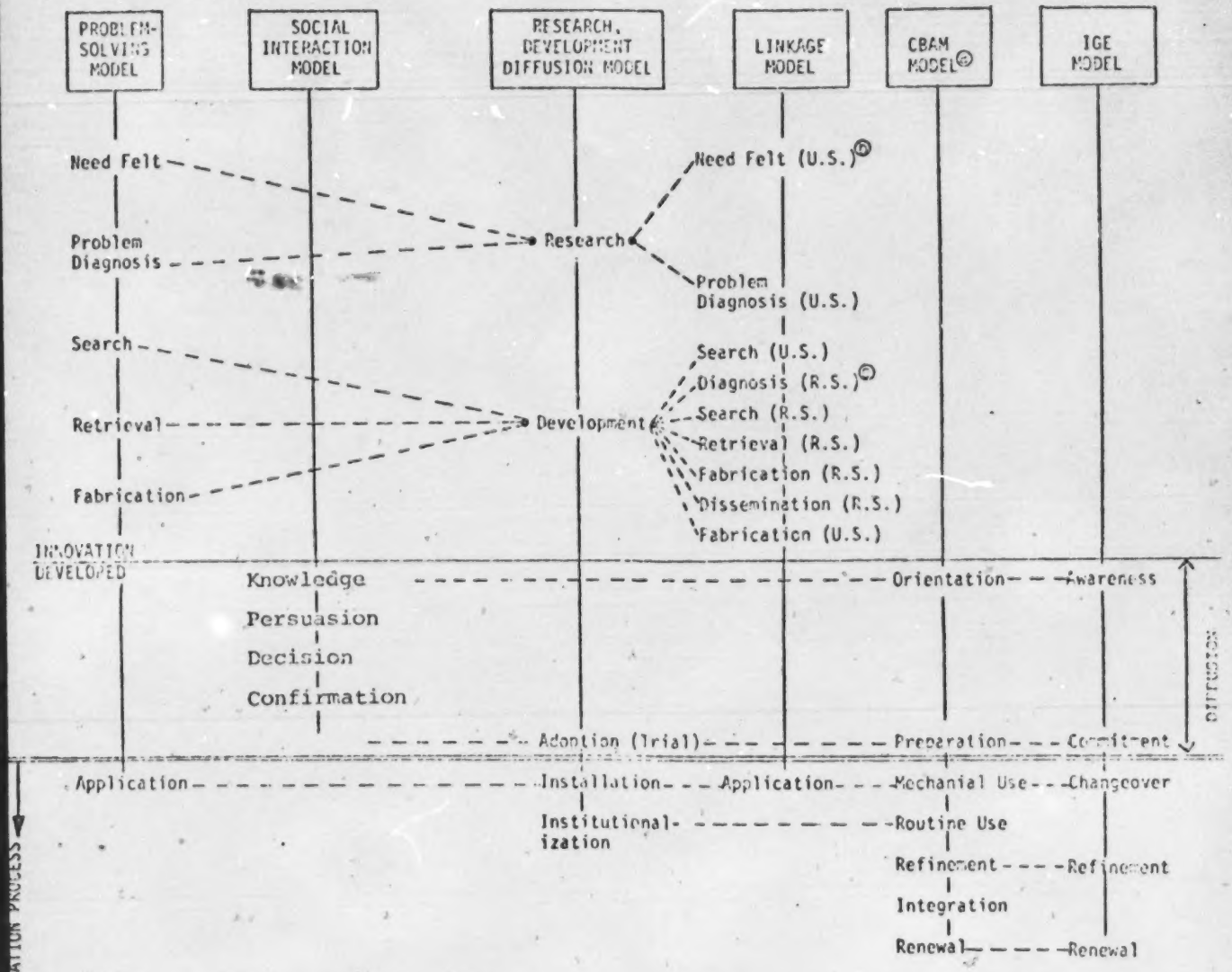
The developers of Individually Guided Education (IGE) conceptualized the ideal process for the adoption and implementation of their innovation. The model consists of five phases: awareness, commitment, changeover, refinement and renewal (Heffernan, Mancusi, Klenke, 1976). The IGE change model is primarily concerned with the diffusion of an innovation not the development of one. By far the most specific of the six models, the IGE model rests on the following assumptions:

1. The innovation to be adopted is IGE--an already developed innovation.
2. Adoption of IGE must be schoolwide.
3. The IGE resource system (the R&D Center or its representatives) initiates contact with the user system during adoption.
4. Training and information to the user system are provided by the Wisconsin R & D Center, /I/D/E/A/, or their recognized representatives.
5. Inservice training must be provided to principals and teachers prior to implementation of IGE.
6. The adoption of IGE is formalized by written or stated agreement between school officials and implementation agencies.
7. The user system has the option to accept or reject IGE (Barrows et al., 1979).

The six change models are attempts by researchers to explain the process by which innovations are adopted and implemented. Each model specifies phases through which innovators are expected to proceed linearly. By comparing the phases of the six change models graphically, the varying emphases of the models are highlighted (see Table 2).

Table 2

A COMPARISON OF THE PHASES OF SIX CHANGE MODELS



NOTES:
a = Level 0: Non-use is not included.
b = U.S. is the User System.
c = R.S. is the Resource System.

Using the definitions suggested by the Studies of Implementation, all phases above the double horizontal solid lines on Table 2 are part of the adoption process; those below the double solid lines are implementation stages; phases between the single and double horizontal solid lines are stages of diffusion, a subset of the adoption process concerned with the spread of an already developed innovation. The single horizontal solid line indicates that an innovation has been developed. The lack of phases above the single solid lines for three of the models indicates that the existence of the innovation is assumed.

The broken horizontal lines connect equivalent phases of the six models. For example, "knowledge" in the social interaction model is comparable to the "orientation" level in the CBAM and "awareness" in the IGE model. Graphic comparison of the phases of the models not only suggests similarities of the models but also indicates greater specification of common phases by some of the models.

The change models have been shown to vary with respect to primary emphasis, assumptions about roles of participants, and specified phases. Table 3 summarizes the similarities and differences in the six models by indicating their respective emphases, the stimulus for adoption (i.e., what started the change process) and the origin of the adoption stimulus.

As Table 3 suggests, three of the models place some emphasis on innovation development, two emphasize implementation, and three describe the process by which innovations are spread. Further,

Table 3

A COMPARISON OF THE SIX CHANGE MODELS BY EMPHASIS, ADOPTION STIMULUS, AND ORIGIN FOR ADOPTION STIMULUS

Model	Primary Emphasis	Adoption Stimulus	Origin for Adoption Stimulus
Problem-Solving Model	Innovation (Solution) Development	Awareness of a Problem	The User System
Social Interaction Model	Innovation Diffusion	May be either Innovation Awareness or Problem Awareness	The Resource System or the User System
RD&D Model	Innovation Development and Diffusion (equal emphasis)	Awareness of an Innovation	The Resource System
Linkage Model	Innovation Development and Diffusion (equal emphasis)	Awareness of a Problem	The User System System
CBAM	Innovation Implementation	Awareness of an Innovation	The Resource System
IGE Model	Innovation Diffusion and Implementation	Awareness of an Innovation	The Resource System

Table 3 indicates that in three models awareness of an existing innovation is the stimulus for change; in two problem awareness begins the process; in one either problem or innovation awareness may be the stimulus. The stimulus for adoption, according to three of the models, originates outside the user system; in two models the stimulus must be within the user system, and in one model the stimulus may originate in either system.

The diversity of the six change models allowed the researchers to analyze the adoption histories from a variety of perspectives. In this research, the adoption events in the 13 research sites was compared to the procedures described by the models. Knowledge of the change models suggested that data be collected with respect to the following questions:

1. Was the innovation developed by the user system or the resource system?
2. Was adoption stimulated from inside or outside the school?
3. Did search for an innovation arise from an existing problem state or did a problem state evolve from awareness of the innovation?

The answers to these guiding questions were obtained through retrospective interviews and document analysis. A semi-structured history interview was developed, and administrators, teachers, and aides

who were present during the adoption process were interviewed. A total of 67 people were interviewed in the 13 sites. In some sites, written records of the adoption process (e.g., minutes from meetings, formal contracts, and inderdepartmental memoranda) were available for analysis. Reconstructed adoption histories for each of the sites were developed from the data, and the accuracy of the histories was verified by informants in each of the sites. (The complete histories are presented in Technical Report No. 529 by Barrows et al., 1979). For the purpose of this paper, the data from the adoption histories were analyzed with respect to the six change models.

Findings Related to the Change Models

The six models presented earlier purportedly describe and prescribe behavior during the change process. But none of the six models had great explanatory power for the adoption experiences in the 13 research sites. Rather, the data from the 13 sites suggests that these models are inadequate in depicting the adoption process. Their inadequacy occurs for two reasons: (a) the models in general are based on seemingly unjustified and, in some cases, naive assumptions, and (b) the individual models tend to highlight one part of the change process and, as a result, are only partial explanations of a more global process.

Assumptions of the Change Models

Two major assumptions on which some of the change models are based did not hold in the actual adoption experiences of the 13 research sites. The first assumption, a prerequisite of the problem-solving, linkage, and CBAM models, is that awareness of an educational problem is the stimulus for seeking an innovation. The second assumption which was not met in the adoption experiences of the 13 sites relates to the role of the user system. While there is some variation in the amount of user participation prescribed in the six change models, all six assume a somewhat active role for the user system. The problem-solving model specifies the greatest amount and the R & D and IGE models the least (see Table 4). In this study, the innovation under focus was the Instructional Programming Model (IPM). The actual "users" of the innovation, i.e., the individuals who applied the innovation to the client group and who were expected to play an active role in adoption were classroom teachers. The inapplicability of these two assumptions in the adoption histories of the 13 sites is described in more detail below.

Assumption One. The stimulus for seeking an innovation is awareness of an educational problem.

The problem-solving, linkage, and CBAM models specify that the change process begins with the awareness of an educational problem.

Table 4

ASSUMPTIONS ABOUT THE ROLE OF THE USER SYSTEM

IN THE SIX CHANGE MODELS

Model	Awareness
Problem-Solving Model	The user system recognizes a need or problem and desires a solution. The user system actively participates in seeking a solution. The user system actively participates in the selection of the solution.
Social-Interaction Model	The adoption process begins by awareness of the innovation or a problem by the user system. The user system actively seeks information about the feasibility of the innovation for the present situation.
RD&D Model	The user system accepts the recommendation of the research organization to adopt the innovation.
Linkage Model	The user system recognizes a need or problem and desires a solution. There must be a reciprocal relationship between the resource and user systems characterized by the ability of each to stimulate the search and retrieval process of the other.
CBAM	The user system recognizes a need or problem. The innovation is adopted by the user system to solve an identified problem.
IGE Model	The user system has the option to accept or reject IGE.

Campbell (1966) alternatively suggests that the change process may begin with either problem awareness or awareness of an innovation and that "the major determinant factor in the dichotomy is whether recognition of the problem comes before or after awareness of the innovation in question" (p. 461). Using Campbell's determinant factor, the adoption stimulus in the 13 sites was identified. As shown in Table 5, awareness of the innovation was the adoption stimulus in 8 of the 13 sites. Teachers, principals, or central office people became aware of IGE (and the IPM) or DMP before perceiving a problem state in their school or district. Interest in adoption of the innovation grew out of knowledge of its existence.

Though the IPM is an instructional innovation, there were only two cases of problem awareness in which the identified problem was an instructional problem. At Rise School, primary teachers were troubled by the "nagging problem of several non-readers each year" and consciously sought an alternative to the traditional age-graded reading instruction. In the school district where Davis School is located, the superintendent observed little interaction between the elementary schools and identified a need to pull his badly fragmented system together. He therefore began searching for an innovation to unify the district.

In three schools (all in urban areas) where problem awareness preceded innovation awareness, the problems were of a very broad educational nature. Star School was designated as an IGE school because of the need to provide a specialty school in the central city and comply with the desegregation order. Both Mercury and York schools

Table 5

THE ADOPTION STIMULUS IN THE THIRTEEN RESEARCH SITES

School	Adoption Stimulus (Innovation)	Awareness by Whom
Lewis	Innovation Awareness (IGE)	Resource System[e] (Principal & Teachers)
Star	Problem Awareness[a]	Resource System (Central Office)
Arrow	Innovation Awareness (IGE)	Resource System (Central Office)
Mercury	Problem Awareness[b]	Resource System[e] (Building Committee appointed by Central Office)
Meadow	Innovation Awareness (IGE)	Resource System (Principal & Central Office)
Sawyer	Innovation Awareness (IGE)	Resource System (Central Office)
Rise	Problem Awareness[c]	User System (Teachers)
North	Innovation Awareness (IGE)	Resource System (Central Office)
Davis	Problem Awareness[d]	Resource System (Central Office)
York	Problem Awareness[b]	Resource System[e] (Building Committee appointed by Central Office)
Canal	Innovation Awareness (DMP)	Resource System (Central Office)
Ware	Innovation Awareness (DMP)	Resource System (Central Office)
Miller	Innovation Awareness (DMP)	Resource System (Central Office)

NOTES:

[a] a social-political problem--the need to respond to a desegregation order

[b] overcrowding--the need to build a new school

[c] an instructional problem--nonachieving students

[d] a general educational need--to unify the system

[e] User System did not exist; school not yet constructed

were built in the mid-1970's in response to population growth on the edge of the city. In both cases, the need to build a new school prompted the appointment of building committees and the subsequent search for an instructional program to be housed there.

In the remaining eight schools, the impetus for change was awareness of an innovation. In all eight cases, members of the resource system were introduced to IGE or DMP and subsequently desired adoption. They were not actively seeking a problem solution at the time they encountered the innovation.

In sum, problem awareness preceded innovation awareness in only 5 of the 13 sites. In only two of the five cases was the identified problem an instructional one. Thus, in the majority of the schools studied, a basic assumption of the problem-solving, linkage, and CBAM models--that problem awareness precedes innovation awareness--did not hold.

Assumption Two. The user system plays an active role in the adoption process.

As noted earlier, the amount of user system participation prescribed by the six change models varies according to the model (see Table 4). In addition to specifying problem awareness as the adoption stimulus, the problem-solving, linkage, and CBAM models further require that the problem be identified by the user system. As Table 5 clearly shows, of the five cases in which problem awareness was the adoption stimulus, in only one instance was the user system responsible for problem identification. At Rise School, the teachers were the first to become aware of the IPM at a college course and later

implemented the IPM in reading. In the four other cases where problem awareness preceded knowledge of the innovation, i.e., at Star, Mercury, Davis, and York schools, central office personnel recognized broadly defined educational concerns.

It is interesting to note that in all eight cases in which the adoption stimulus was innovation awareness, the resource system (i.e., persons other than the teaching staff) first became aware of the innovation (see Table 5). Generally, central office personnel were the first to learn of the new idea, but in two cases principals were initially introduced. In one case (Lewis School) where teachers were mentioned as among the first to hear of the innovation, the school at which the innovation was eventually implemented was not yet in existence. Though some teachers were involved, they were not the subsequent implementors and cannot be considered to be the user system.

While the social interaction model does not require that problem awareness or innovation awareness be identified by the user system, it does specify that the user system be actively involved in seeking information about the feasibility of the innovation for the present situation. The teachers in only two sites, Rise School and North School, actually participated in exploring the appropriateness of the innovation for their own school setting.

All six change models specify that the user system at least has the opportunity to accept or reject the adoption of the innovation. As indicated in Table 6, teachers in only three schools were involved in making the decision to adopt.

Thus, the active role of the user system as prescribed by the various change models did not hold in the majority of cases. In few cases were the actual users of the innovation involved in: (a) identifying an educational problem, (b) assessing the feasibility of the innovation for their present situation, or (c) making or confirming the decision to adopt.

In addition to being based on certain unwarranted assumptions, the change models were found to be inadequate because the individual models highlight different parts of the change process and are, therefore, only partial explanations of the more global process. In the next section, the varying emphases of the models will be discussed.

The Varying Emphases of the Change Models

As mentioned earlier, the six change models differ with respect to the emphasis each places on the various aspects of the change process (see Table 3).

Table 6

LOCUS OF THE FORMAL DECISION TO ADOPT THE INNOVATION AND CONFIRMATORY STATUS OF THE USER SYSTEM

School	Locus of Formal Decision	Opportunity to Confirm Adoption by the User System
Lewis	Principal and Central Office	No[a]
Star	Central Office Management Team	No
Arrow	Central Office	No
Mercury	Building Committee	No[a]
Meadow	Principal and Central Office	No
Sawyer	Central Office and Principal	No
Rise	Principal and Teacher	Yes
North	Principal and Teacher	Yes
Davis	Central Office	No
York	Building Committee	No[a]
Canal	Central Office and Principal	Yes
Ware	Central Office and Resource Teacher	No
Miller	Central Office and Principal	No

NOTE: [a]User System did not exist at the time of the formal decision to adopt--i.e., a new school was created.

As a result of their varying emphases, none of the 6 change models adequately describes the adoption experiences in all 13 sites. Rather, some of the models explain parts of the adoption histories in various sites or several models combine to explain the adoption behavior in one particular school. Table 7 illustrates the fit between the adoption data in the 13 sites and the adoption assumptions of the six change models. The following discussion details the applicability of each of the models to the combined experiences of the sites.

The Utility of the Models

The Problem-Solving Model

The problem-solving model fully described the adoption process in only 1 of the 13 sites--Rise School. The problem-solving model, which emphasizes an orderly, rational procedure for solution development, could also describe events at Mercury and York schools if the user system had been redefined as the school building committee (since an actual user system did not exist at the time of adoption). The problem-solving model seemed inapplicable to the adoption histories of the 13 sites primarily because (a) problem awareness was rarely the stimulus for adoption, and (b) the user systems were only infrequently involved in either seeking or selecting a problem solution.

The Social Interaction Model

At least half of the assumptions of the social interaction model were met in all 13 sites. At Rise School, all the assumptions

Table 7

FIT OF THE ADOPTION HISTORY IN THE THIRTEEN SITES

WITH THE ASSUMPTIONS OF THE SIX CHANGE MODELS

Schools	Problem-Solving	Social-Interaction	RD&D	Linkage	CBAM	IGE
Lewis	O[a]	H	L	O[a]	L	M
Star	O	H	L	O	L	M
Arrow	O	M	L	O	L	M
Mercury	O[a]	H	L	O[a]	L	M
Meadow	O	H	L	O	L	L
Sawyer	O	M	M	O	H	M
Rise	A	A	A	L	M	M
North	O	M	M	O	L	A
Davis	O	H	L	O	L	L
York	O[a]	H	L	O	L	M
Canal	O	H	A	O	H	NA[b]
Ware	O	H	M	O	H	NA[b]
Miller	O	H	M	O	H	NA[b]

KEY: A = all assumptions met

M = more than half the assumptions met

H = half the assumptions met

L = less than half the assumptions met

O = none of the assumptions met

NOTE: [a]User system did not exist at the time of adoption.

[b]Does not apply--the innovation adopted was not IGE.

were met. Of the six change models, the social interaction model, which emphasizes the spread of innovations, was the most applicable in all sites. Its widespread applicability highlights the importance of collegial contact in the diffusion of innovations. Its narrow emphasis on diffusion, however, makes it a very limited change model.

The Research, Development, and Diffusion Model

The RD&D model assumes that an innovation has been developed by an R & D organization employing an orderly development sequence. For both innovations--IGE and DMP--this assumption held in all cases. The RD&D model further assumes that the innovation is disseminated by the R & D organization or its agent and that the user system has the opportunity to approve of its adoption. In 2 of the 13 sites, all these assumptions were met. However, the model failed to explain the adoption history in the other ten sites because either (a) the R & D Center or its agent was not the disseminator (in one case); (b) the user system had no opportunity for approval of adoption (in two cases); or (c) neither condition was met (in seven cases). The RD&D model is a highly specialized model because of the assumed role of R & D organizations. While it seems reasonable that the model should be applicable to the adoption of IGE and DMP, which were R & D innovations, it was not.

The Linkage Model

The linkage model did not apply in any of the 13 sites. The lack of applicability of the linkage model is not surprising given

its historical development. The linkage model is an eclectic model which is based on a synthesis of the problem-solving, RD&D, and social interaction models. As such, it is a prescriptive model of logico-deductive origin and is not data based. Given that the three previous models failed to have great explanatory power, it is not surprising that the eclectic model is of even less use in describing real world behavior.

The CBAM

The CBAM, according to its developers, is also an eclectic model. As such, it too suggests much prescriptive behavior but is based on little empirical data. Half or more of the assumptions of the CBAM were met in only 5 of the 13 sites. There are two assumptions which tended to make this model inapplicable. First, the model assumes that the stimulus for adoption is problem awareness. Problem awareness was the stimulus in only five sites. Second, the model assumes the creation of a temporary third system, a "collaborative adoption system," which links the user and resource systems together. These temporary systems did not evolve in the 13 sites. The CBAM appears to be heavily prescriptive--a third system "should" develop--rather than descriptive of how planned educational change has been observed to occur.

The IGE Model

One could reasonably expect that since the innovation under study in 10 of the 13 sites is IGE, the IGE model of change should

describe the adoption experiences of 10 of the 13 sites. Yet all of the assumptions underlying the model were met in only one of the ten cases--North School. Generally, two of the seven underlying assumptions were not true. The common factor in the two assumptions is again the user system. The resource system, according to the model, supposedly makes contact with the user system and the adoption process begins. In reality, the resource system contacted administrators. Teachers were involved only after the decision to adopt was made. Second, teachers (the user system) very rarely had an opportunity to approve adoption. The fact that the adoption behavior in the research sites did not conform to the assumptions of the IGE model implies that this model, like the linkage model and CBAM, is a prescriptive model which tells what "ought" to be but not necessarily what usually is the case.

An Alternative Conception of the Adoption Process

The analysis of the adoption data in the 13 schools indicate that the 6 change models are inadequate for describing the adoption experiences of our research sites. First, the models are not useful when the assumption of an active user system is violated. The models simply do not allow for "top-down" decisions for adoption. As has been shown in the case histories, 10 of the 13 user systems did not even minimally participate in the decision to adopt.

Second, the models do not account for an external stimulus or impetus for change. The models assume planned, incremental change

in response to a problem identified by the user system. The data do not support an orderly, gradual progression toward change. In eight of the ten Wisconsin sites, the presence of a major external event such as the fire at Lewis School or the desegregation order at Star School initiated adoption decisions.

The models also depict the change process as involving a linear sequence of events. Our data suggest that the adoption process, as defined by the Studies of Implementation work group, includes three components which interact dynamically over time. These components, which include adoption context, legitimization, and user preparation, will be explicated in the following discussion.

An alternative conception of the adoption process must account for the above mentioned shortcomings of the six change models. Assumptions which were not verified in the real experience of the people in the 13 sites must not become foundations of an alternative conception. Rather, a reconceptualization of the adoption process must evolve from the data themselves; the data should be the source of the key elements of the conceptualization.

Components of an Alternative Conceptualization of the Adoption Process

Adoption Context

The first component which is integral to an alternative conceptualization of the adoption process has been identified as the adoption context. This context is composed of those activities, experi-

ences, or occurrences which contribute to or impede the adoption process in an existing school district. These activities can be initiated by and impact on key actors in the adoption process. The actors can be members of two groups: the user system and the resource system. Because the nature of the IPM innovation necessarily implies an instructional focus, the resource system has been defined as anyone external to the teaching unit, e.g., principals, central office staff, and school board members. The context per se has no beginning or ending point; rather, it is those activities and interactions that occur over the entire adoption process.

Adoption context events may be of two types: (a) external events, which produce a sudden and dramatic need for restructuring of the existing institution; and (b) internal and incremental events, which allow for natural and evolutionary adaptations to be made in the existing institution. Each event has the potential to contribute to or hinder the school system's potential for adopting the innovation. Our data suggest that these events cannot be viewed in isolation; rather, the actors exert influence and interact within an extremely complex and multi-dimensional framework. In addition, our data suggest that the same adoption context events are perceived differently according to user and resource system role status, and that they therefore may exert differential impact on these two role groups.

At each site events internal to the system resulted in the adoption of the innovation. At the same time the data suggest that these internal events are greatly influenced by events external to the

system. The presence of important external events is generally omitted from many conceptualizations of the change process. Our data specifically suggest that the impact of external events may have different effects on the adoption process. They may influence the sequence of events in the adoption context dimension, or they may affect behavior of either or both the user and resource groups, or they may dictate the speed at which a solution is reached.

For example, at Lewis School internal events leading in the direction of individualizing instruction had been occurring for several years. A number of inservices had been held, and one plan for establishing an IGE school had been formulated. But it was the fire at Lewis School which led to the actual adoption of IGE. The effect on the resource system was the immediate need to provide adequate facilities for the displaced students and teachers. The user system was also affected. Teachers were dispersed throughout the district unitl adequate facilities could be provided. The fire thus served as a catalyst and accelerated the change process in the district. IGE, which had been a topic of discussion for a long time, quickly became the instructional program of the newly constructed Lewis School.

At Star School, an external event was also the impetus for the adoption of IGE. In this instance, a federal court order imposed on the district demanded the formulation of a plan to desegregate the school district by a specific date. The primary impact of this external event was felt by the resource system, i.e., the central office. In the development of the desegregation plan, Star School an inner-city,

predominantly minority school was paired with a majority school which had been implementing IGE for several years. In order to increase the likelihood that students would be exchanged between the two schools, Star School was also designated as an IGE school. This decision was made by the central office, and the user system was not involved at any point in the decision-making process.

In the cases of Mercury, York, Sawyer, and Meadow schools, conditions external to the school district, namely, changing enrollment patterns, caused the district to make adjustments in the school's programs. The impact of the enrollment shifts was dealt with at the central office level, and in each instance the response involved the adoption of IGE. In two schools new buildings were constructed to house IGE programs; in the other two sites, IGE was introduced at the same time that building additions were completed.

Our data, then, have resulted in the conceptualization of context as any event which contributes to or impedes the adoption process. Context events may occur either within the system (internal or incremental events) or outside the system (external events). Also context events may be perceived by and impact differently on members of the resource and user systems.

Legitimization

A second key element in the alternative adoption conceptualization of the adoption process is legitimization. Since the innovation was adopted by each of the 13 sites, it was, by definition,

"legitimized" by the school district. However, the process by which this legitimization occurred varied widely across the districts. Our data suggest that the user and resource systems assumed one of the following positions: (a) facilitative, in which the user and/or resource system member(s) actively solicited adoption of the innovation; or (b) permissive, in which the user and/or resource system member(s) assumed a passive posture, that is, they permitted adoption to occur without overtly helping or hindering the process. This permissive position implies an implicit sanctioning of the actions of others as they relate to the adoption of the innovation. The data also suggest that each role group, i.e., central office administrators, principals, and teachers, has specific but varying organizational means by which to legitimize the innovation, such as by vote, by decision, or by decree.

In 10 of the 13 sites, legitimization occurred solely by decision of the resource system; in the other three sites, the decision was shared with the user system by means of a vote. In each site, the actions of either the user or resource groups were legitimized by the school board. When not involved in the decision, the user system assumed a permissive role. In the case of Mercury, York, Davis, Arrow, and Lewis schools, teachers passively sanctioned the activities of the resource system. At Star, Sawyer, Meadow, Ware, and Miller schools, teachers were totally unaware of the efforts of the resource system.

At North and Canal schools, both the resource and user systems played a facilitative role in legitimization. In these two cases,

interaction between the two systems was directed toward seeking a decision to either accept or reject the innovation. In each instance, both the user and resource systems voted to adopt the IPM.

At Rise School, the user system assumed a facilitative role. That is, the events leading to the adoption of IGE were initiated and directed by the user system. A vote was taken among teachers to either accept or reject the innovation. The resource system responded in a permissive mode by simply sanctioning the efforts of the user group.

Thus, the data lead to a conceptualization of legitimization which suggests that

1. Legitimization of an innovation may occur at several levels within a school district and that while legitimization in some form always occurred at the level of the resource system, it only occasionally occurred at the user level.
2. The user and resource systems may play either facilitative or permissive roles in legitimization.
3. There are a variety of organizational means by which the resource and user systems can legitimate the adoption of the innovation.

Preparation for Use

The third key element of the alternative conceptualization has been termed preparation for use. Preparation for use involves

two dimensions: providing the user system with the necessary technical resources (i.e., time, materials, staff, and facilities) demanded for implementation of the innovation and providing inservice training to the user group. The data suggest that within this second dimension there are multiple inservice activities which occur during the entire adoption process. Pre-decision activities occur before the adoption decision and are designed to influence users to adopt the innovation; post-decision activities occur after the adoption decision and are designed to prepare teachers for use of the innovation.

At Rise School, for example, teachers attended a university course on IGE prior to the decision to adopt. As a result of their class participation, they sought the principal's support. After the teachers had decided jointly with their principal to implement IGE, they participated in additional IGE inservices within their school building to prepare for the use of the innovation.

An important component of this alternative conceptualization of the adoption process is the dynamic nature of the interaction between the three dimensions--adoption context, legitimization, and preparation for use. Our data suggest that these dimensions are not independent but rather highly interactive. The dynamics of the interplay among and between these three dimensions are the heart of the adoption process. Put simply, the adoption process is the result of

the interaction between these three dimensions, and can assume a multiplicity of sequences each having a differing impact upon the adoption sequence of an innovation. Two examples which demonstrate the dynamics of the interplay between the three elements and highlight the variety of sequences among the elements are presented in the next section.

The Adoption Process at Rise and Meadow Schools

The adoption histories at Rise and Meadow schools differed greatly from one another. At Rise School, several teachers sensed a need to improve the school's instructional program and became aware of the innovation (the IPM) through a course at the local university. The teachers (User System) examined the feasibility of the IPM for their own situation and decided they wanted to try the innovation. With the consent and support of their principal, the primary teachers embarked on a one year trial of the IPM. At the end of the year, the entire school staff and principal decided to implement the innovation schoolwide.

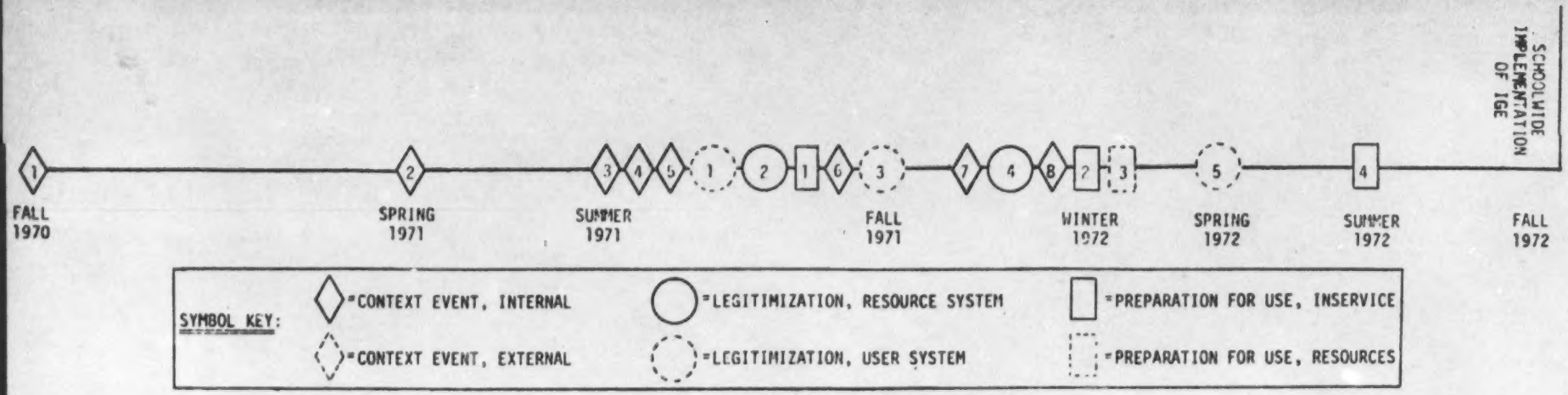
At Meadow School, teachers had no awareness of an instructional need in their school and no input into the decision to adopt the innovation. The superintendent and the principal made the adoption decision and their decision was simply announced to the staff. With little preparation or pre-planning, use of the innovation was begun just months after the decision to adopt was announced. Teachers at Meadow School report being unenthusiastic about implementation but resigned to

a situation over which they felt they had no control.

Using the three key elements suggested in the alternative conceptualization of the change process, context events, legitimization, and preparation for use, the adoption histories of these two schools can be tracked. Figures 1 and 2 represent the adoption histories of the two sites in some detail. Obviously, not all the events that contributed to the adoption of the IPM can be included on the diagrams. However, the key events as identified by those administrators and teachers present at the time of adoption have been included.

Although the events in Figures 1 and 2 are placed along a timeline, the adoption process should not be construed to be linear. By using varying symbols for context, legitimization,and preparation events, it is possible to demonstrate the cycling of the elements as they occur. Placement of a symbol at a particular point does not necessarily indicate that the event starts and ends at one given point in time. Rather, placement of a symbol represents the beginning of the event which, in reality, may continue for a period of time. For example, context event seven (◇7) in Figure 1 represents the primary teachers trial of the IPM. The trial began in the fall of 1971 and continued throughout the school year.

Figure 1 demonstrates several interesting points about the adoption history of Rise School. First, the events leading up to the implementation of the IPM at Rise spanned a two-year period with the majority of events occurring in rapid succession over the later year and a half. Second, all the context events were of an internal, incre-



SEQUENCE OF EVENTS:

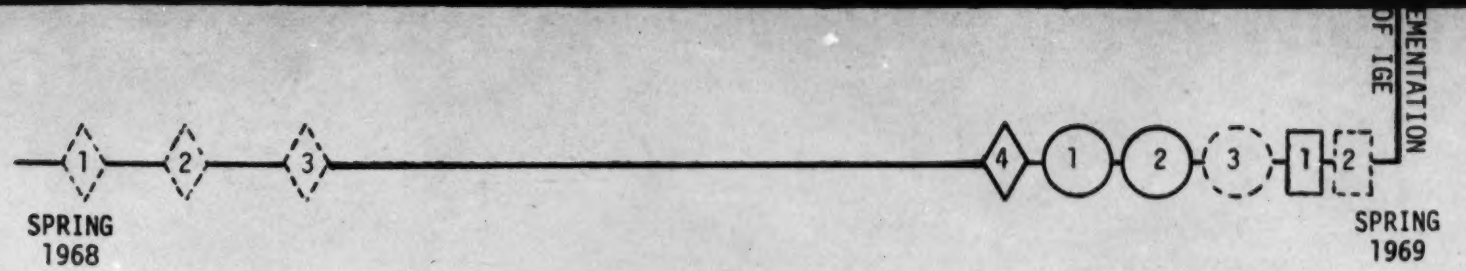
1. = IGE Institute established at UW-Tall Pines.
2. = Primary teachers dissatisfied with instructional program.
3. = Primary teachers attend UW-Tall Pines class on individualizing instruction (IGE).
4. = Primary teachers invited principal to attend some class sessions.
5. = LEAP League established.
1. = Primary teachers decide they want to try IGE.
2. = Principal approves teachers' decision.
1. = Principal and primary teachers plan for trial.
6. = Principal and primary teachers meet with school staff to discuss their interest in IGE.
3. = Staff at school approves the trial for primary teachers.
7. = Trial period begins--primary unit tries IGE.
4. = School Board signs IGE contract with R & D Center and the State Department of Public Instruction.
8. = IGE implemented in five other district schools.
2. = Teachers attend IGE workshops.
3. = Teachers visit other IGE schools.
5. = Staff votes to implement IGE schoolwide.
4. = Teachers attend inservices to prepare for implementation.

FIGURE 1: ADOPTION EVENTS AT RISE SCHOOL

mental nature which demonstrates the gradualness of change at Rise School. Third, legitimization of the adoption decision occurred in both the User and Resource Systems but began with the User System. Fourth, preparation for use not only included the provision of inservice for teachers but also the allocation of physical resources in anticipation of implementation.

Overall, Figure 1 demonstrates that the three elements in the alternative conceptualization of the adoption process rotated over the two-year period. That is, context events occurred throughout the period, not just during the initial time span; legitimization re-occurred frequently throughout the process as did preparation activities. The 17 events which comprised the adoption history of Rise School occurred in the following pattern: 5 context (C)--2 legitimization (L)--1 preparation (P)--1C--1L--1C--1L--1C--2P--1L--1P. In sum, Figure 1 represents the adoption process at Rise School as being gradual, user-centered, and interactive. The three key elements cycle through the process.

The adoption history at Meadow School, as represented in Figure 2, spanned a one-year period. At the start of the year, several dramatic context events triggered by the decision to close two schools stimulated the consideration of an educational alternative. For more than half a year, no key events which contributed to the adoption of the innovation were reported to have occurred. Activity began, however, when two district administrators enrolled in a university IGE course as the time approached to open the new addition.



SEQUENCE OF EVENTS:

1 = School Board decides to close two outlying district schools.

2 = School Board decides to build addition to Meadow School to accommodate influx of students from closed schools.

3 = Discussion begins about the nature of the instructional program to be housed in the new addition.

4 = Superintendent and principal take IGE course at UW-Chevron.

1 = Principal and superintendent agree that IGE should be implemented in the new addition of Meadow School.

2 = Principal announces decision to implement IGE to school staff.

3 = Teachers permissive of adoption; feel "drafted."

1 = Inservices on IGE conducted by principal for teachers.

2 = Building addition completed; materials purchased.

FIGURE 2: ADOPTION EVENTS AT MEADOW SCHOOL

As shown in Figure 2, legitimization occurred predominately at the resource system level. The teachers (i.e., User System) were only involved as they reacted to the decision made by their organizational superiors. Further, as seen in Figure 2, preparation for use of the innovation was minimal and occurred just prior to actual implementation.

In viewing the adoption history of Meadow School from a broader perspective, it is clear that there was little interaction between the three key elements of the alternative conceptualization. All context events began before any legitimization activity started, and all preparation began after the other two types of events were initiated. Thus, the pattern at Meadow School was: 4 context events--3 legitimization--2 preparation. In sum, Figure 2 represents the adoption history at Meadow School as being initiated "top-down" and the result of an external and dramatic event. User participation is depicted as minimal, and preparation for use sparse.

Figure 3 depicts the two adoption histories side-by-side. The combined figures demonstrates clearly the differences between the two schools in the timing of events, the level of activity and the sequence in which the different elements occurred. Figure 3 further demonstrates the utility of the alternative conceptualization of the adoption process. Though the adoption histories of the two sites differ considerably in terms of the role the user systems played, the stimuli for change, the speed at which change occurred, and the sequence of adoption events, the alternative conceptualization was able to depict the histories meaningfully. Quite different adoption patterns

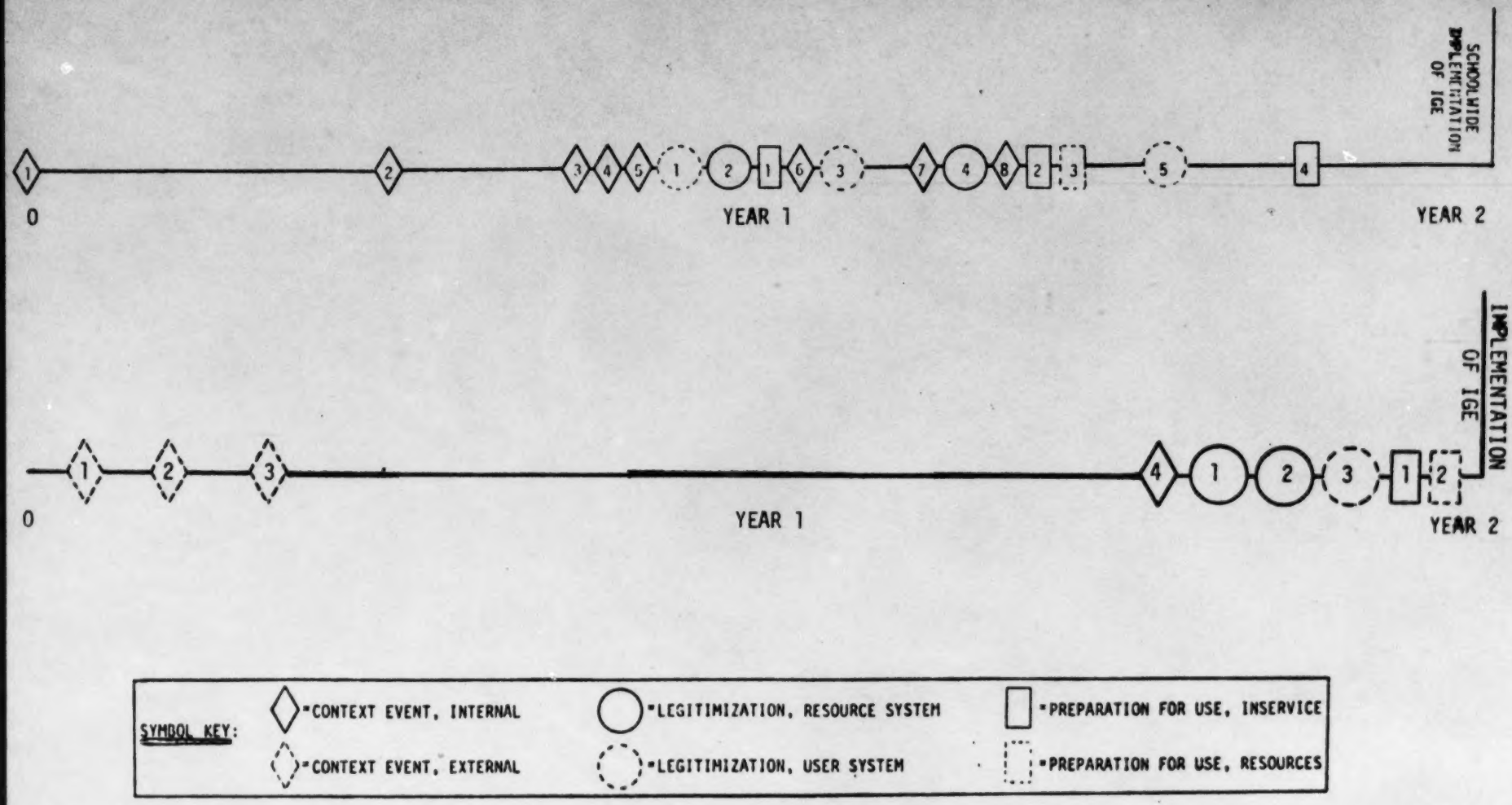


FIGURE 3: A COMPARISON OF THE SEQUENCE AND TIMING OF EVENTS AT RISE and MEADOW SCHOOLS

42.

emerged from the two histories using the alternative conceptualization.

A logical next step for continued research would be to document the degree of implementation of the innovation in each of the sites and compare the degree of implementation with the adoption patterns. Establishing the connection between the adoption and implementation is of great interest from a research standpoint but is beyond the scope of the present research project.

Summary

In this paper, six current theories of planned change were reviewed. Empirical data collected in 13 elementary schools that were committed to a course of change were compared to the theories. None of the six theories proved adequate in explaining the adoption histories of the 13 sites. Their inadequacy occurred for two reasons: (a) the theories in general were based on unjustified assumptions and (b) the theories tended to emphasize only certain segments of the entire change process and were, therefore, incomplete descriptors of a more global process. An alternative conceptualization which avoided these shortcomings was suggested. Three key elements of the alternative were identified--adoption context, legitimization, and preparation for use. Using the key elements, the alternative conceptualization was used to diagram the adoption patterns in two of the 13 sites. It was suggested that future research should attempt to relate differing patterns of adoption to the degree of implementation of an innovation.

BIBLIOGRAPHY

Barrows, L.; Klenke, W.; and Heffernan, J. The adoptions of innovations in school. Technical Report # 529. Madison, Wisconsin: Wisconsin Research and Development Center for Individualized Schooling, 1979.

Campbell, R. A suggested paradigm of the individual adoption process. Rural Sociology, 1966, 31, 458-466.

Davis, W.; Klenke, W.; and Barrows, L. Foundations of the studies of implementation: The innovation and research sites. Technical Report #494. Madison, Wisconsin: Wisconsin Research and Development Center for Individualized Schooling, 1979.

Hall, G.; Wallace, R., Jr.; and Dossett, W. A developmental conceptualization of the adoption process within educational institutions. Austin, Texas: Research and Development Center for Teacher Education, The University of Texas at Austin, 1973.

Havelock, R. Planning for innovation through dissemination and utilization of knowledge. Ann Arbor, Michigan: Center for Research on Utilization of Scientific Knowledge, Institute for Social Research, the University of Michigan, 1971.

_____. Planning for innovation. A Comparative Study of the Literature on the Dissemination and Utilization of Scientific Knowledge. Ann Arbor, Michigan: Institute for Social Research, The University of Michigan, 1969.

Heffernan, J.; Mancusi, D.; and Klenke, W. IGE implementor's manual (2nd Edition). Madison, Wisconsin: Wisconsin Research and Development Center for Individualized Schooling, 1976.

Miles, M. (Ed.) Innovation in education. New York: Teachers College Press, 1964.

Rogers, E., and Shoemaker, E. Communication of innovations. New York: Free Press of Glencoe, 1971.